

## BRIEFER ARTICLES

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### THE STAINING OF WOOD FIBERS FOR PERMANENT MICROSCOPIC MOUNTS

In the preparation of wood fibers for permanent microscope mounts there is some difficulty in fixing a deep enough color, especially in the vessels of the hardwoods, when simple solutions of aniline dyes, such as safranin, are used; and the method of using such a reagent as Haidenhain's haematoxylin involves much time and loss of some elements due to washing. To avoid these difficulties a saturated solution of nigrosin in picric acid may be employed.

To macerate the fibers the original green or dry wood is soaked in a mixture of 5 per cent nitric and 5 per cent chromic acids in equal parts, with heating to about 70° C. if there is little time. A somewhat stronger solution may be used cold, and in practice has resulted in sufficient maceration in the course of one or more days, depending largely upon the kind of wood being treated. It is not necessary to macerate the complete piece of wood, as radial slices may be removed and the fibers carefully separated out with needles long before complete maceration is accomplished. After washing once in distilled water, the fibers are immediately put into the stain. To prepare the stain, saturate distilled water with picric acid and then saturate the solution of picric acid with nigrosin, and in applying to the fibers use a 25 per cent solution of the stain in distilled water. Fibers prepared according to this method are sufficiently stained, almost immediately, to a very fine light blue, which becomes darker until a deep blue-black is reached as they remain longer in the stain. In case the fibers do not take up the color, which seldom happens in the case of wood fibers, but is often the case in certain textile fibers, a stronger solution may be used. Even with the full strength, certain textile fibers, apparently those like cotton which contains no lignin, will not stain after a prolonged treatment. After staining, the material may be dehydrated and mounted in balsam in the usual manner. Benzol balsam is the kind we have employed, although there appears to be no reason why xylol balsam should not be used. The color will not hold in glycerin jelly mounts. In case a precipitate appears it may be

removed by adding a drop of concentrated hydrochloric acid to the distilled water in which the fibers are washed just after staining.

To secure permanent mounts showing a differentiation between groundwood and sulphite pulp as ordinarily found in newsprint, the following modification is of value. Leave the newsprint, which has been reduced to pulp, in a moderately strong solution of fuchsin for some hours, dehydrate with absolute alcohol and transfer to benzol, transfer back to a moderate solution of nigrosin in absolute alcohol, and after a few minutes transfer again to benzol. Superfluous stain may be washed out with either fresh absolute alcohol or with benzol. Mount in balsam. The groundwood shows red while the sulphite is blue. Bordered pits in some of the tracheids of the sulphite show a red torus and the pit openings are often reddish.

Further studies are being carried on to determine the qualities of this method for staining other types of material.—H. N. LEE, *Forest Products Laboratories of Canada, Montreal, Canada.*